REMARKS

Receipt of the Office Action mailed December 30, 2005 is acknowledged. By the above claim amendments, applicants have cancelled claims 2, 19, 20, 22, 25, 29, 32, 38, 45, 52, 61, 71, 82, 93, and 107. Applicants have further amended Claim 1 to incorporate the recitation in Claim 2, and claims 4, 8, and 21 to correct formal errors. No new matter has been added. Entry of the amendment and favorable reconsideration are earnestly solicited.

Claim Objections

Claims 4, 20, and 21 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. The examiner is perfectly correct that in claims 4, 20 and 21 Cu should be Zr. Applicants thank the examiner to have corrected this typo, and have amended the claims accordingly, overcoming the claim objections.

Claim Rejections - 35 U.S.C. § 102

The Office Action rejected Claims 1, 3-11, 14, 18, 21, 23, 26, 28, 30, 31, 33, 35-37, 39, 41-44, 46, 48-51, 53, 55-60, 62, 64-70, 83-92, 106 under 35 U.S.C. 102(a) or (e) as being anticipated by Rioja (US 6,562,154). The Office Action further rejected Claims 1, 3-11, 13, 14, 18, 21, 23, 26, 28, 30, 31, 33, 35-37, 39, 41-44, 46, 48-51, 53, 55-60, 62, 64-8 1, 83-92, 106 under 35 U.S.C. § 102(b) as being anticipated by Cassada III (US 5,593,516). Applicants respectfully traverse.

As an initial matter, the alloy claimed in the pending application is "substantially manganese free," which, according to the present specification, means "up to 0.05% Mn." See Specificaiton at ¶ [0008]. Contrary to the assertion in the Office Action, the Al-Cu alloy taught by Rioja does not overlap the presently claimed ranges because it contains Mn in the range 0.3-0.7. Accordingly, it is respectfully submitted that the claim rejections under 35 U.S.C. § 102 over Rioja are improper and should be withdrawn.

In any event, in order to expedite prosecution, without acquiescing to the assertions in the Office Action, Applicants have amended Claim 1 to incorporate the recitation of Claim 2. Accordingly, it is respectfully submitted that these claim rejections have been further rendered moot.

Claim Rejections - 35 U.S.C. § 103

The Office Action rejected Claims 2, 7-13, 17, 19, 20, 22, 25, 29-71, 76-92, and 106 under 35 U.S.C. §103(a) as being obvious over Rioja (US 6,562,154), asserting that Rioja teaches Al-Cu alloy products whose ranges of compositions overlap with the instantly claimed products, and renders the claims *prima facie* obvious. The Office Action further asserts that one of ordinary skill in the art would be motivated, by a general, unspecified "suitable utility," to modify the teachings of Rioja to select any portion of the range. Applicants respectfully traverse.

Mn Concentration of the Claimed Products Do Not Overlap With Those in* Rioja, *Nor Is There Any Suggestion That Mn Concentration Should be Modified

First and foremost, as discussed above, the aluminum-copper alloy disclosed in Rioja contains Mn in the range 0.3-0.7, and is ***NOT*** "substantially Mn-free". There is simply no Mn concentration range overlap. In other words, Rioja, the only reference cited for the obviousness rejection, does not teach all elements of the claimed invention. Therefore, the Office Action has not established a *prima facie* case of obviousness. Based on this reason alone, the obviousness rejection of the claims is improper and should be withdrawn.

Moreover, the Mn concentration of the instantly claimed alloy product has been lowered ***against the teachings of Rioja***. The present inventors demonstrated that manganese has a deleterious effect manganese on toughness. (*See* the examples; *see alsl* Figures 1 and 2 below, which are graphic representations of the data in the Specification). To the contrary, Rioja strongly encourages the addition of manganese, for example column 9 lines 17-18 ("Manganese additions are beneficial for strength properties."), and column 10 lines 15 to 18 ("The strength and toughness combinations of the sheet products with ***high*** Mn variants are better than those of

2524-T3. Surprisingly, the low Cu-high Mn sample exhibits higher properties than the high Cu-low Mn sample." (emphasis added). The preferred Al-Cu base alloy according to Rioja contains about 0.3 to about 0.7 weight percent Mn (column 4 lines 63,64). In other words, there is no suggestion or any motivation in Rioja to modify its teachings to arrive at the instantly claimed invention.

Sc Concentration in* Rioja *Does Not Overlap With Those in the Claimed Products, And* Rioja *Does Not Contain Any Suggestion or to Modify Sc Concentration to Arrive at the Tightly Controlled Range of the Claims

The Office Action also asserts that, because Rioja mentions an amount of Sc of 0.06%, approximating the presently claimed 0.05% Sc, and broadly teaches that Sc can be added in ranges of up to 1 wt%, "which overlaps the presently claimed range," it would be obvious for one of ordinary skills to modify Rioja to make the instantly claimed alloy and products.

Applicants respectfully submit that this assertion is incorrect. The present inventors surprisingly discovered that the addition to copper containing aluminum alloys, of an tightly controlled amount of scandium, coupled with absence of manganese, achieves a superior balance between strength and toughness. Sc addition in copper containing aluminum alloys needs to be very precisely defined because Sc interacts with Cu to form (Al, Cu, Sc) phases. It was found that for the present invention a level of 300 ppm was appropriate in order to substantially avoid the precipitation of (Al, Cu, Sc) phases while keeping a strong anti-recrystallization influence (see §45 of the pending application). *The fact that a tightly controlled amount of Sc is needed to achieve this superior compromise between toughness and strength is not taught or in any way suggested by Rioja.*

For example, the specification show that, in the T39 temper, a balance between strength (UTS L-direction, Tables 4) and toughness (Kapp L-T, Table 6) can be achieved, and for a similar strength, by tightly controlling Sc concentration, the gain in toughness is more than 10% and for a similar toughness the gain in strength is more than 6%. Figure 1 below is a graphic representation of the data in Tables 4 and 6.

Figure 1. Strength/toughness balance in the T39 temper

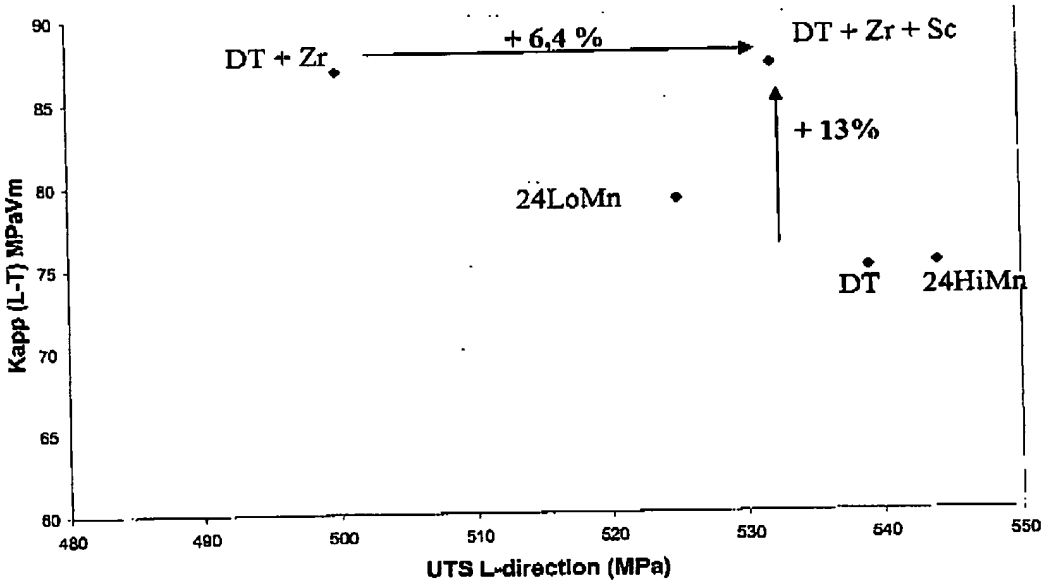
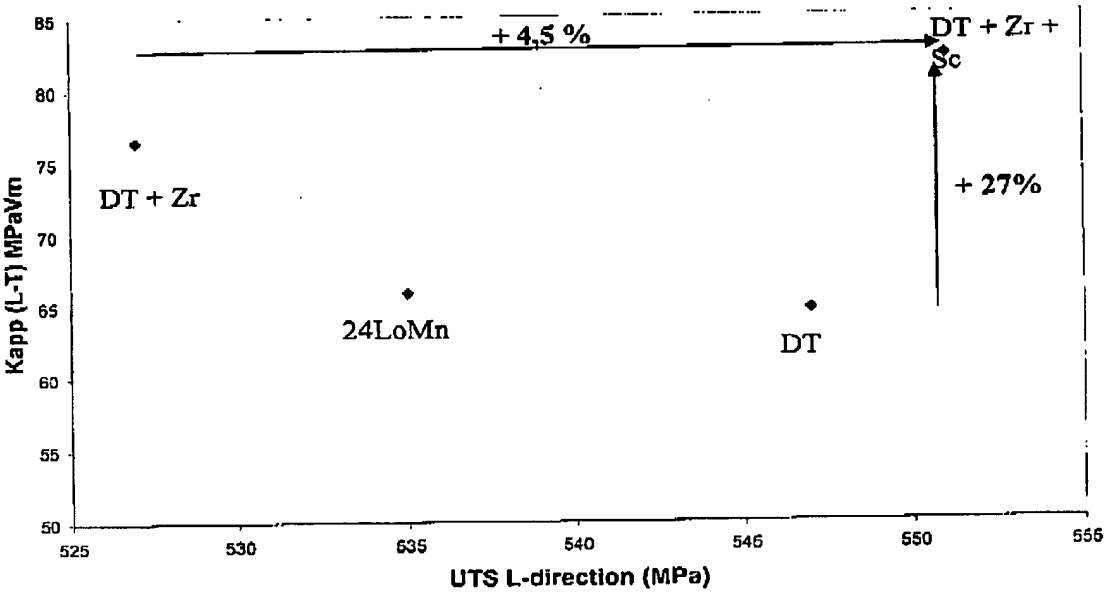


Figure 2. Strength/toughness balance in the T89 temper



Similarly, the specification shows that, in the T89 temper, the best results in strength and toughness are obtained with the substantially Mn free alloy containing Sc in a tightly controlled amount. Data in Tables 9 and 10 show that for a similar strength, the gain in toughness is more than 25%, and for a similar toughness the gain in strength is more than 4%. Figure 2 above is a graphic representation of those data.

In any event, Rioja does not teach a range or a minimum value for Sc. It merely provides one example with an amount of 0.06%, which is 20% higher than the ***maximum*** of the claimed 0.05 limit, while, as indicated above, the Sc amount should be very tightly controlled in order to achieve the desired results. Contrary to the assertions in the Office Action, the broad "teaching" in Rioja that Sc can be as high as 1% has no bearing to the present claims, as it does not create a range that overlaps the claimed range. Moreover, the value of 1% mentioned in Rioja has no practical meaning because one skilled in the art knows that under standard casting conditions using such a high level of Sc, eutectic precipitates would form with a deleterious effect on toughness.

Lower wing skin structural member

It is further noted that the obviousness rejection of claims comprising a plate is improper. Claims 13, 71-81 are directed to lower wing skin structural members, which are made out of plates with a gauge in the order of 12 to 25 mm (§0037). Similarly, claims 32-37, 45-51 are directed to products comprising a plate, which is defined as products thicker than 12 mm (§0009 of the pending application).

In contrast, Rioja is solely directed to fuselage skin sheet applications. According to Rioja (column 4 line 8), sheets include products having a thickness from 0.01 inch (0.25 mm) to 0.35 inch (8.89 mm). Indeed, Rioja is trying to obtain aluminum sheets with a particular grain structure, comprising elongated grains and a precise texture with specific Brass and Goss volume fractions for low gauges. Aluminum sheet usually exhibit rather recrystallized microstructure, especially for the low gauges. Thus, the problem that Rioja intends to solve is specific to the sheet application and cannot be generalized for lower wing skin applications, which are in a

higher thickness range.

Conclusion

In view of the above proposed amendment and foregoing remarks, Applicants respectfully submit that all claims are now in condition for allowance and earnestly solicit an early indication from the Examiner to that effect.

If there are any questions regarding this response or the application in general, a telephone call to the undersigned would be appreciated since this should expedite the prosecution of the application for all concerned.

Applicants submit herewith the fee of $120.00 to cover the one month extension of time via credit card authorization. However, if an additional fee is due, please charge our Deposit Account No. 11-0553, under Order No. 2901683.4 from which the undersigned is authorized to draw.

Dated: May 1, 2006

Respectfully submitted,

By _____

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